ODICAL
2(3599)

122(3599)

Proceedings of the United States National Museum

SMITHSONIAN INSTITUTION • WASHINGTON, D.C.

Volume 122 1967 Number 3599

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Portunid Crabs From the International Indian Ocean Expedition in the Smithsonian Collections (Crustacea: Portunidae)

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SMITHSONIAN PRESS

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Portunid Crabs from the International Indian Ocean Expedition In the Smithsonian Collections (Crustacea: Portunidae)

By W. Stephenson and May Rees[1]

The present material, mostly collected by the *Anton Bruun* on Cruises 1 and 4B, comprises 35 recognisable species that are present in very unequal numbers. Of the total of 3444 specimens, 2250 were of one species (*Portunus argentatus*). Of the remaining 1194, 442 specimens were of one species (*Charybdis hoplites*) and 550 of the other four (*C. callianassa*, *C. edwardsi*, *C. rostrata*, and *P. pulchricristatus*). At the other extreme, 18 species were represented by less than five specimens. Several of these are common inshore or shallow water species in the Indo-West Pacific area, including *C. feriatus*, *C. natator*, *P. pelagicus*, *P. sanguinolentus*, *Scylla serrata*, and *Thalamita crenata*. Their small numbers indicate merely that during the cruises these environments usually were neglected in preference for offshore situations.

There is comparable heterogeneity in the numbers of species recorded from the different stations; thus, five species were recorded from 1 station (202A), four species from 7 stations, three from 10, two from 16, and one species from 34 stations. Stations 201A, 202A,

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and 202B were the richest trio of stations with respect to number of species recorded (4, 5, 4, respectively) and number of individuals (434, 1760, 289, respectively).

Throughout, synonymy has been abbreviated in most cases to a few recent references that permit ready identification. Fuller listings are given in cases where the synonymy has presented problems.

Dimensions are those of breadths and are given in millimeters. Measurements were by dial calipers to the nearest 0.1 mm, but these are given below only to the nearest 0.5mm.

Genus *Charybdis* de Haan, 1833

Charybdis callianassa (Herbst)

Cancer callianassa Herbst, 1789, pl. 54, fig. 7 (fide Leene, 1938).

Charybdis (*Charybdis*) *callianassa* (Herbst).—Leene, 1938, pp. 81–4, figs. 41–43.—Stephenson, Hudson, and Campbell, 1957, pp. 493–5, figs. 1B–D, 2C, 3D, pl. 1 (fig. 2); pl. 44.—Stephenson and Rees, 1967, p. 8.

Material examined.—1 ovig. female (30 mm), Sta. No. AB 40–63. 4 males (22.5–27 mm), Sta. No. 203B. 53 males (16.5–30.5 mm), 91 females (20–29 mm), Sta. No. 203C. 1 male (32 mm), 1 female (29 mm), Sta. No. 204A. 1 female (18.5 mm), Sta. No. 222A. 5 males (20–25.5 mm), 16 females (19–31.5 mm), 2 ovig. females (20.5–23.5 mm), 3 *Sacculina*-infested specimens (20–22 mm), Sta. No. 223A. 5 males (19.5–25 mm), 1 female (18 mm), Sta. No. 224A. 1 ovig. female (23 mm soft, without appendages), Sta. No. 9682.

All trawled in shallow water (12.5–33 m); all notings on nature of bottom mention mud.

Remarks.—In many specimens the ridge on the cardiac region of the carapace is very indistinct, and these specimens are difficult to key out from Leene (1938). The last listed specimen probably belongs to this species, but, in absence of chelipeds, there is some uncertainty.

C. ihlei Leene and Buitendijk (1949, pp. 291–3; figs. 1, 4a), closely resembles the present species but differs in having a bifid first antero-lateral tooth and a different male pleopod. This species apparently is known only from the holotype.

Distribution.—Karachi to northern Australia.

Charybdis feriatus (Linnaeus)

Cancer feriatus Linnaeus, 1758, p. 625.

Charybdis (*Charybdis*) *cruciata* (Herbst).—Leene, 1938, pp. 24–7, figs. 1, 2.—Stephenson, Hudson, and Campbell, 1957, pp. 495, 497, figs. 2E, 3F, pl. 1 (fig. 3), pl. 4B.—Crosnier, 1962, pp. 75–7, figs. 130–2.

Charybdis cruciata (Herbst).—Sakai, 1939, pp. 403–4, pl. 82 (fig. 3); 1965, pp. 123–4, pls. 62, 63 (fig. 1).

Charybdis (*Charybdis*) *feriatus* (L.).—Stephenson and Rees, 1967, p. 10.

MATERIAL EXAMINED.—1 male (77.5 mm), Sta. No. AB 47B–63. 1 female (34 mm), Sta. No. 201A. 1 female (76.5 mm, no trace of pigment), Sta. No. 9682.

All trawled, in depths of from 12.5 to 30 m.

DISTRIBUTION.—East coast of South Africa to Japan and Australia.

Charybdis hongkongensis Shen

Charybdis (*Goniohellenus*) *hongkongensis* Shen, 1934, p. 46, figs. 11, 12.—Leene, 1938, pp. 110–113, figs. 61, 62.

MATERIAL EXAMINED.—9 males (18–54 mm), 1 *Sacculina*-infested male (34.5 mm), 2 females (27.5–37.5 mm), Sta. No. AB–20. 3 males (29.5–34.5 mm), 1 female (18.5 mm), Sta. No. AB–41A. 1 male (38.5 mm), Sta. No. AB42–63.

All trawled, depths from 29 to 60 m.

DISTRIBUTION.—Hong Kong (Shen, 1934); Banda Sea; Diamantpunt, Sumatra (Leene, 1938).

Charybdis hoplites (Wood-Mason)

FIGURE 1

Goniosoma hoplites Wood-Mason, 1877, p. 422.—Alcock and Anderson, 1894, p. 184; 1896, pl. 23 (fig. 6).

Charybdis (*Goniohellenus*) *hoplites* (Wood-Mason).—Alcock, 1899a, p. 67; 1899b, p. 66.—Nobili, 1906, p. 119.—Gordon, 1931, pp. 534–5, figs. 12b, b′ [under *C. sinensis*].—Leene, 1938, pp. 99–102, figs. 53, 54a–c.

Charybdis (*Goniohellenus*) *hoplites* var. *pusilla* Alcock, 1899b, p. 67.—Leene, 1938, pp. 102–4, figs. 55, 56a, b.

MATERIAL EXAMINED.—171 males (18–43 mm), 95 females (18–30.5 mm), 49 ovig. females (20–33.5 mm), 1 *Sacculina*-infested specimen (27 mm), 1 unsexable specimen (25.5 mm), 4 fragmented specimens, Sta. No. 201A. 3 males (18–24.5 mm), 3 females (23–43 mm), 1 ovig. female (33.5 mm), Sta. No. 202A. 3 males (20–22.5 mm), 4 females (18.5–33.5, 1 fragmented), 9 ovig. females (16.5–24 mm), 1 *Sacculina*-infested male (24.5 mm), Sta. No. 202B. 2 males (23, 23.5 mm), 1 ovig. female (22.5 mm), Sta. No. 202C. 23 males (16–22.5 mm), 12 females (15.5–21 mm), Sta. No. 212A. 2 males (20, 23.5 mm), Sta. No. 213A. 2 males (17.5, 22 mm), 1 ovig. female (19 mm), Sta. No. 218A. 1 male (17.5 mm), 1 ovig. female (19.5 mm), Sta. No. 221A. 1 ovig. female (20.5 mm), Sta. No. 228A. 1 ovig. female (21 mm), Sta. No. 237A. 29 males (17.5–31 mm), 8 females (19–23 mm), 8 ovig. females (18.5–23.5 mm), Sta. No. 241A. 1 male (20.5 mm), 1 female (21.5 mm), Sta. No. 248A. 4 males (22.5–30.5 mm), Sta. No. 249A. 1 female (27 mm), Sta. No. 252A. 1 female (23.5 mm), Sta. No. 253A. 1 male (27.5 mm), Sta. No. 255A. 1 male (ca. 22.5 mm), 1 female (ca. 29.5 mm), (both cephalothorax only),

Sta. No. 263A. 3 males (17–28.5 mm), 3 females (21–28.5 mm), Sta. No. 264A. 1 male (25 mm), 3 females (23–25.5 mm), Sta. No. 265A. 1 female (40 mm), Sta. No. 268A. 1 female (41 mm), Sta. No. 270A.

All trawled, depths from 35 to 368 m, bottoms mostly mud, but one station (202B) of coral and sand.

Remarks.—The above specimens differ from Leene's (1938) description of the forma typica only in the following minor particulars:

1. On the anterior border of the arm of the cheliped, Leene describes two spines and a tubercle. In most of the present specimens, three spines are present, but in the larger specimens there are often four.

2. The upper border of the carpus of the second pair of walking legs bears either no armature or microscopic spinules. Leene describes

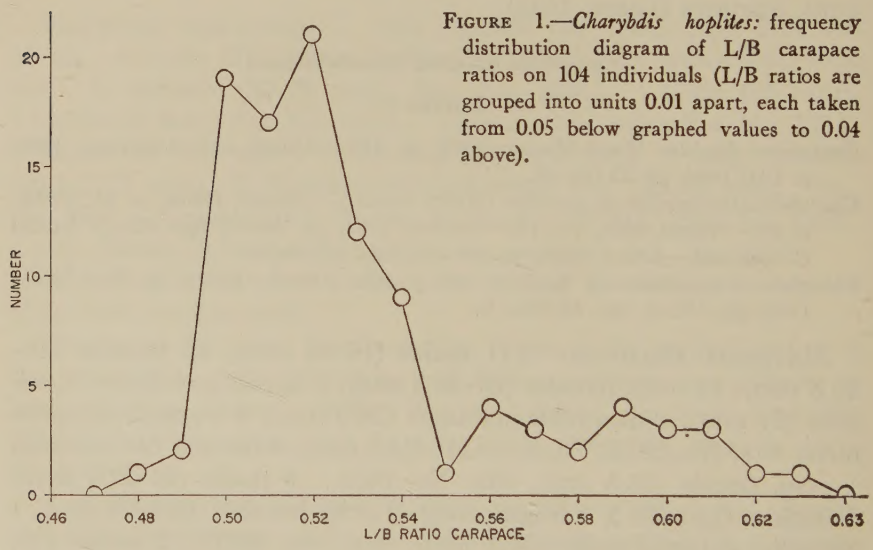

Figure 1.—*Charybdis hoplites:* frequency distribution diagram of L/B carapace ratios on 104 individuals (L/B ratios are grouped into units 0.01 apart, each taken from 0.05 below graphed values to 0.04 above).

the forma typica as bearing either three spinulessor being unarmed and the var. *pusilla* as bearing microscopic spinule.

3. These specimens usually have a very small cluster of granules on the carapace posterior to each mesobranchial area.

Sixteen individuals were noted with carapaces narrower than the remainder, and two more appeared when samples were measured. These were from eight stations, and in six cases these were stations from which typical *C. hoplites* were recorded. Apart from carapace proportions the specimens did not appear to differ in any way from the remainder.

Measurements made upon the original 16 narrower specimens and upon randomly selected specimens from the remainder showed that the differences in proportions were not primarily due to different lengths of the last anterolateral teeth; thereafter only lengths and breadths of carapaces were measured. L/B ratios were variable and were not obviously related to the size or sex of the specimens. Data on 104 specimens are given as a frequency distribution diagram on figure 1. The specimens include the 16 narrow individuals, randomly chosen small individuals from several collections, and the larger individuals from several collections. Because the figure shows only a slight hint of bimodality, the narrower specimens do not merit separation from the remainder.

Alcock's var. *pusilla* appears to be within the range of variation of the one taxonomic entity and, following Leene's suggestion, is added to the synonymy of the present species. On the other hand, Leene's (1938) var. *omanensis* merits specific status, although there are problems of synonymy with *C. smithii* Mc Leay 1838. Meanwhile Leene's var. *longicollis* clearly has specific status (see below).

Charybdis longicollis Leene

Charybdis hoplites Balss, 1924, p. 2 [specimens from Ras Abu Somer].
Charybdis (*Goniohellenus*) *hoplites* var. *longicollis* Leene, 1938, pp. 107–110, figs. 59, 60a–c.—Stephensen, 1945, pp. 118–9, figs. 24 F–G, 25.—Crosnier, 1962, pp. 86–7, figs. 140, 147, 148, pl. 7 (fig. 2).
Charybdis (*Goniohellenus*) *longicollis* Leene.—Holthuis, 1961, pp. 47–50, figs. 14, 15.
Charybdis longicollis Leene.—Lewinsohn and Holthuis, 1964, pp. 57–8.
Not *Charybdis hoplites* Wood-Mason, 1877, p. 422.

Material examined.—1 male (40.5 mm), Sta. No. 258A. 3 males (24.5–28 mm), 1 female (21 mm), Sta. No. 266A. 1 ovig. female (29 mm), Sta. No. 268A.

All trawled, depths from 30 to 368 m, bottoms all muddy.

Remarks.—*Charybdis hoplites* and *C. longicollis* resemble each other in possessing (1) relatively short and slightly curved anterolateral borders, (2) last anterolateral teeth of moderate length and directed laterally or slightly forwards, (3) anterolateral teeth generally somewhat square-cut, but with forwardly directed anterior spines, (4) mesobranchial area of carapace swollen, (5) no longitudinal line of granules on carapace running from mesogastric to metagastric region, (6) metagastric region of carapace with short granular ridges, (7) median frontal lobes protruding beyond submedians and narrowly rounded.

Charybdis longicollis is distinguished from *C. hoplites* by having (1) cardiac and mesobranchial areas of carapace with ridgelike elevations, as against granular patches; (2) sides of antepenultimate

segment of male abdomen strongly as against slightly concave; (3) first pleopod of male relatively straight and thin as against sinuous and thick, outer side with relatively few subterminal bristles, inner side with large subterminal bristles as against spinules or small bristles.

DISTRIBUTION.—Eastern Mediterranean, Red Sea, Ras Abu Somer, Ravayah, Persian Gulf, Gulf of Oman, Malgache [Madagascar], and Seychelles.

Charybdis miles (de Haan)

Portunus (*Charybdis*) *miles* de Haan, 1835, p. 41, pl. 11 (fig. 1).

Charybdis miles (de Haan).—Stimpson, 1858, p. 39.—Doflein, 1902, p. 659.—Rathbun, 1902, p. 27.—Stimpson, 1907, p. 82.—Parisi, 1916, p. 175.—Balss, 1922, p. 104.—Yokoya, 1933, p. 175.—Sakai, 1939, p. 405, pl. 46 (fig. 2); 1965, p. 123, pl. 61.

Goniosoma miles (de Haan).—A. Milne Edwards, 1861, pp. 378, 385.—Ortmann, 1893, p. 81.

Charybdis (*Goniosoma*) *miles* (de Haan).—Alcock, 1899a, pp. 62–3.—Chopra, 1935, p. 486, fig. 9.—Shen, 1937, p. 123, fig. 13.

Charybdis (*Charybdis*) *miles* (de Haan).—Leene, 1938, pp. 38–43, figs. 10, 11, 12, 13.—Stephenson, Hudson, and Campbell, 1957, pp. 500–1, figs. 2H, 3I, pl. 2 (fig. 3), pl. 4F.—Rees and Stephenson, 1966, p. 37.—Stephenson and Rees, 1967, p. 11.

MATERIAL EXAMINED.—1 male (52.5 mm), 1 ovig. female (47.5 mm), Sta. No. AB–20. 1 male (51.5 mm), Sta. No. AB21–63. 1 male (26.5 mm), 1 female (28 mm), Sta. No. 255A. 4 males (21.5–54 mm), 1 ovig. female (47.5 mm), Sta. No. 256A. 1 female (54.5 mm), Sta. No. 261A. 1 male (81.5 mm), 1 female (30.5 mm), Sta. No. 262A.

All trawled, depths 55–99 m, muddy bottoms (in cases where records made).

REMARKS.—See *C. riversandersoni*.

DISTRIBUTION.—Previously from Ganjam Coast of India to Hong Kong, Japan, and eastern Australia. Now eastward to Gulf of Oman.

Charybdis natator (Herbst)

Cancer natator Herbst, 1789, pl. 40 (fig. 1) [fide Leene, 1938].

Charybdis (*Charybdis*) *natator* (Herbst).—Leene, 1938, pp. 93–7, figs. 50, 51.—Stephenson, Hudson, and Campbell, 1957, pp. 501–2, figs. 2G, 3H, pl. 2 (fig. 4), pl. 4J.—Crosnier, 1962, pp. 82–3, figs. 143–4, pl. 13 (fig. 2).—Stephenson and Rees, 1967, p. 11.

Charybdis natator (Herbst).—Sakai, 1939, p. 407.—Barnard, 1950, pp. 169–70.

MATERIAL EXAMINED.—1 male (64 mm), Sta. No. AB46–63. 2 females (20–26.5 mm), Sta. No. 201A.

Both probably trawled, depths 23–55 m, muddy bottom (Sta. 201A only).

REMARKS.—The small specimens from Station 201A differ from large specimens in having (1) much more conspicuous carapace areas,

(2) relatively larger first anterolateral teeth, (3) short granular ridges on the postfrontal areas of the carapace, and (4) longer wrist spines. These small specimens are close to *C. moretonensis* Rees and Stephenson (1966), who list the distinguishing features.

DISTRIBUTION.—East coast of Africa to Japan and Australia.

Charybdis orientalis Dana

Charybdis orientalis Dana, 1852a, p. 285, pl. 17 (fig. 10); 1852b, p. 85.—Sakai, 1939, pp. 407–8, pl. 53 (fig. 2).

Charybdis (*Charybdis*) *orientalis* Dana.—Leene, 1938, pp. 68–72, figs. 32–34 [excluding some synonymy].—Stephenson, Hudson, and Campbell, 1957, pp. 502–3, figs. 2B, 3B, pl. 3, (fig. 1), pl. 4G.—Crosnier, 1962, pp. 80–1.—Stephenson and Rees, 1967, p. 11.

Not *Charybdis orientalis* Edmondson, 1946, p. 281, fig. 173e (= *C. hawaiiensis*).

MATERIAL EXAMINED.—1 male (38.5 mm), India, north side Okah Point, Port Okah, Mar. 9, 1963. 7 males (ca. 23–58 mm), 7 females (34–ca. 67 mm), Sta. No. LW–1. 3 males (18.5–73.5 mm), 3 females (21–34.5 mm), Sta. No. RF–2.

Shore collections, rocky and sandy bottoms.

REMARKS.—This species resembles *C. hellerii* (A. Milne Edwards), particularly the larger individuals in which the second anterolateral tooth is barely smaller than the first. Both species possess an extension of the posterior border of the carpus of the natatory leg, but, whereas that in *C. orientalis* is a blunt tubercle, in *C. hellerii* there is a sharp spine.

Rees and Stephenson (1966) have shown that Leene (1938) was incorrect in synonymizing *C. incisa* Rathbun, 1923, with *C. orientalis*, and Edmondson (1954) has also shown that *C. hawaiiensis* is a separate species.

DISTRIBUTION.—Malgache [Madagascar] and East Africa to Japan and Australia.

Charybdis riversandersoni Alcock

Charybdis (*Goniosoma*) *riversandersoni* Alcock, 1899a, p. 53.—Alcock and McArdle, 1902, pl. 40 (fig. 3).

Charybdis sagamiensis Parisi, 1916, p. 175, pl. 11 (fig. 1).

Charybdis riversandersoni Alcock.—Balss, 1922, p. 105.—Gordon, 1931, pp. 537–8, fig. 13c.—Sakai, 1939, pp. 404–5, pl. 46 (fig. 1); 1965, pp. 122–3, pl. 60 (fig. 2).

Charybdis (*Charybdis*) *riversandersoni* Alcock.—Leene, 1938, pp. 28–30, figs. 3, 4a, 4b.

MATERIAL EXAMINED.—1 female (26 mm), Sta. No. 202A. 2 males (65.5, 75.5 mm), Sta. No. 263A. 1 male (18.5 mm), 2 females (26, 34.5 mm), 1 additional cheliped, Sta. No. 264A.

All trawled, depths from 46 to 291 m, muddy bottoms.

Remarks.—The largest specimen has four spines on the anterior borders of the arms of the chelipeds; all of the remaining chelipeds bear three spines on these borders. All specimens have the characteristically swollen branchial regions of the carapace.

This species, which is close to *C. miles*, has the undersurface of the immovable finger smooth and rounded, whereas in *C. miles* it is deeply grooved. There are also differences in the last anterolateral teeth, which are longer and more laterally directed in *C. riversandersoni*.

The two species were also distinguishable by the pigmentation of the present recently preserved specimens. In *C. riversandersoni* the red pigment on the under side of the immovable finger of the cheliped did not extend along its entire length, while in *C. miles* it extended to the distal part of the palm. In the larger males of *C. riversandersoni* there was a pale circle in each postlateral area of the carapace, bordered by deeper pink. This had no counterpart in *C. miles*.

Sakai's (1939) colored plates of fresh material of the two species clearly show the differences in the last anterolateral teeth and in the pigmentation under the immovable finger, but they show *C. riversandersoni* with three pale areas in the postlateral portion of the carapace (pl. 46: fig. 1) and *C. miles* with one pale area (pl. 46: fig. 2). Sakai's (1965) plates again show the differences in last anterolateral teeth, show even more clearly the differences between the colors of the immovable fingers, but show one indistinct light postlateral patch in *C. riversandersoni* (pl. 60: fig. 2), against a very distinct patch in *C. miles* (pl. 61).

Distribution.—Previously Konkak Coast, Bay of Sagami, South China Sea, and now Arabian Sea and Gulf of Oman.

Charybdis rostrata (A. Milne Edwards)

Goniosoma rostratum A. Milne Edwards, 1861, p. 379, pl. 35 (figs. 2, 2b).—Henderson, 1893, p. 377.

Charybdis (*Goniosoma*) *rostrata* (A. Milne Edwards).—Alcock, 1899a, p. 59.—de Man, 1925, p. 326, fig. 2.—Chopra, 1935, p. 491, fig. 12.

Charybdis (*Charybdis*) *rostrata* (A. Milne Edwards).—Leene, 1938, pp. 78–81, figs. 39, 40.

Material examined.—1 female (24 mm), Sta. No. AB–37. 12 males (17–25.5 mm), 50 females (16.5–25 mm), 1 ovig. female (21 mm) (many specimens cephalothorax only), Sta. No. AB–40. 18 males (12–27 mm), 12 females (16.5–25.5 mm), 1 *Sacculina*-infested specimen (22.5 mm), Sta. No. AB 44–63. 1 male (16.5 mm), 6 females (18.5–22.5 mm), Sta. No. AB 44a–63. 1 male (21.5 mm), 1 yg. (5 mm), Sta. No. AB 45–63.

All trawled, depths from 15 to 81 m.

REMARKS.—One of the males (23 mm), from Station AB–40, has the left branchial cavity swollen from containing a parasite. The young specimen from Station AB 45–63, almost certainly belonging to this species, has an almost continuous front with a barely detectable median notch.

Several specimens have three spines on the anterior border of the arm, and these key out to *C. callianassa* from Leene (1938). The present species is immediately recognizable from the prominent frontal teeth.

As Leene has noted, the last anterolateral teeth are longer in females than in males and longer in smaller specimens than in larger ones.

DISTRIBUTION.—Indian region (Ceylon, Calcutta, Andamans) to Indo-Malayan Archipelago.

Charybdis smithii McLeay

Charybdis smithii McLeay, 1838, p. 61.—Krauss, 1843, p. 24.—Stebbing, 1910, p. 37.

Goniosoma truncata (Fabricius).—A. Milne Edwards, 1861, p. 380, pl. 34 (fig. 4).

Charybdis (*Goniohellenus*) *edwardsi* Leene and Buitendijk, 1949, p. 296, figs. 3, 4c.—Della Croce and Holthuis, 1965, pp. 33–7 [with pl.].

Gonioneptunus smithii (McLeay).—Barnard, 1950, pp. 163–4, 818, fig. 37j.

?*Charybdis* (*Goniohellenus*) *hoplites* var *omanensis*, Leene, 1938, pp. 104–7, figs. 57, 58.

Not *Portunus truncatus* Fabricius, 1798, p. 365 (=*Charybdis truncata*).

Stephenson and Rees (in ms.) have examined the type of *C. smithii* and will report more extensively on the synonymy.

MATERIAL EXAMINED.—3 males (59.5–70.5 mm), Sta. No. AB 3–63. 1 female (56 mm), Sta. No. 172 (dipnet at surface). 1 male (63 mm), Sta No. 202A. 1 female (63 mm), Sta. No. 207A. 2 males (both 58.5 mm), Sta. No. 231A. 14 males (61.5–75 mm), 1 female (56.5 mm), Sta. No. 249A. 51 males (56.5–73.5 mm), 10 females (52–61.5 mm), Sta. No. 252A. 3 males (62–67 mm), Sta. No. 253A. 4 males (62–73 mm), Sta. No. 263A. 1 male (59.5 mm), 3 females (50–59.5 mm), Sta. No. 264A. 5 males (49.5–71 mm), 13 females (40.5–60 mm), Sta. No. 268A.

Apart from the first two listed stations, all trawled, in depths of from 70 to 368 m on mud and/or clay bottoms.

DISTRIBUTION.—From a large area of the Indian Ocean, as will be shown in later publications by Stephenson and by Stephenson and Rees.

Charybdis vadorum Alcock

Charybdis (*Goniohellenus*) *hoplites* var. *vadorum* Alcock, 1899a, p. 67.

Charybdis (*Goniohellenus*) *sinensis* Gordon, 1930, p. 522; 1931, p. 534, figs. 11, 12c, d, d′.—Shen, 1934, p. 44, figs. 9, 10.

Charybdis (*Goniohellenus*) *vadorum* (Alcock).—Chopra, 1935, p. 493, text-fig. 13, pl. 9 (fig. 2).—Leene, 1938, pp. 114–7, figs. 63–5.—Stephenson and Rees, 1967, p. 12.

?*Archias sexdentatus* Paulson, 1875, p. 56, pl. 8 (fig. 3–3b).—Nobili, 1906, p. 198 (fide Leene, 1938).

MATERIAL EXAMINED.—2 ovig. females (ca. 21.5, ca. 24 mm) (cephalothorax only), Sta. No. AB 41–63. 4 males (22–23.5 mm), 2 females (21, 24 mm), Sta. No. AB 41–A. 3 males (21–25.5 mm), 1 ovig. female (24 mm), Sta. No. AB 42–63.

All trawled, depths from 29 to 46 m.

REMARKS.—Certain differences between Leene's (1938) description and figures have been noted by Stephenson and Rees (1967). In addition, the frontal teeth are more rounded than Leene figured.

DISTRIBUTION.—Red Sea and Persian Gulf to Hong Kong.

Charybdis variegata (Fabricius)

Portunus variegatus Fabricius, 1798, p. 364.

Charybdis (*Charybdis*) *variegata* (Fabricius).—Leene, 1938, pp. 84–8, figs. 44, 45.—Stephenson, Hudson, and Campbell, 1957, p. 503, fig. 3C, pl. 3 (fig. 2).—Sakai, 1939, p. 406, fig. 9a, pl. 47 (fig. 4); 1965, p. 121, pl. 59 (fig. 2).—Rees and Stephenson, 1966, pp. 39–40.

MATERIAL EXAMINED.—1 male (31.5 mm), Sta. No. AB 46–63.

Probably trawled, depth 23–25 m.

DISTRIBUTION.—Persian Gulf to northern Australia.

Charybdis species

MATERIAL EXAMINED.—Female 15.5 mm, Sta. No. 218–A.

Trawled, depth 79–84 m, bottom sandy.

REMARKS.—This specimen, which is a soft, possibly badly preserved female, has an eared postlateral junction and a basal antennal joint that permits the flagellum to lie in the orbit. These are the diagnostic features of the subgenus *Gonioneptunus*, but the specimen does not resemble any of the known forms within this subgenus and possibly is *C. hoplites*.

Charybdis species

The following specimens were not identifiable beyond generic level: 1 yg. (ca. 3.5 mm), Sta. No. 251B. 1 badly fragmented specimen, Sta. No. 268A.

Genus *Lupocyclus* Adams and White, 1849

Lupocyclus philippinensis Semper

Lupocyclus philippinensis Semper, *in* Nauck, 1880, p. 68.—Leene, 1940, pp. 174–6, fig. 5, pl. 3.—Stephenson and Campbell, 1960, p. 109 [in key].—Crosnier, 1962, pp. 40–1, figs. 49, 51, 53, 56, 57, pl. 2 (fig. 1).

MATERIAL EXAMINED.—3 males (14–19.5 mm), additional larger male (fragmented), Sta. No. 21–63. 4 males (12–13.5 mm), 2 females (13, 16 mm), 1 ovig. female (17 mm) (many specimens fragmented), Sta. No. 202A.

Trawled, depths from 70 to 106 m.

REMARKS.—Crosnier (1962, fig. 53) has accurately shown the curved junction, concave distally, between the ultimate and penultimate segments of the male abdomen. Leene (1940, pl. 3) shows a straight junction.

DISTRIBUTION.—Laccadives, Ceylon, Philippines, Japan.

Genus *Portunus* Weber, 1795

Portunus argentatus (A. Milne Edwards)

FIGURES 2*a–c*, *e–g*

Amphitrite argentata White, 1847, p. 146 [descriptio nulla].
Neptunus argentatus A. Milne Edwards, 1861, pp. 332, 339, pl. 31 (figs. 4, 4a, 4b).
Neptunus (*Amphitrite*) *argentatus* A. Milne Edwards.—Alcock, 1899a, pp. 36–7.—Sakai, 1939, p. 391, fig. 5b, pl. 81 (fig. 1).
Portunus (*Achelous*) *argentatus* (A. Milne Edwards).—Rathbun, 1906, p. 871.—Edmundson, 1954, pp. 238–9, figs. 14, 15.
Monomia argentata (White, A. M. Edwards).—Barnard, 1950, pp. 156–8, figs. 27c, 30a–d.
Portunus argentatus (A. Milne Edwards).—Stephenson, 1961, pp. 105–6, figs. 1F, 3D, pl. 2 (fig. 2), pls. 4D, 5A.—Crosnier, 1962, pp. 50–1, figs. 71, 75, 77, 80, 81, pl. 3 (fig. 1).—Stephenson and Rees, 1967, p. 16.

MATERIAL EXAMINED.—52 males (25.5–34.5 mm), 47 females (23–35 mm), 29 ovig. females (27.5–36.5 mm), 2 *Sacculina*-infested males (32.5, 33 mm), 1 *Sacculina*-infested specimen (29.5 mm), 1 unsexable specimen with both branchial cavities swollen with parasites (22 mm), Sta. No. AB 21–63. 3 males (24–32 mm), Sta. No. AB–22. 7 males (26.5–32 mm), 12 females (24.5–31 mm), 1 *Sacculina*-infested specimen (30.5 mm), Sta. No. AB–22A. 2 females (19, 22.5 mm), Sta. No. AB 28A. 1 fragmented specimen, Sta. No. AB–47B. 1 male (42 mm), Sta. No. AB–49. 1238 males (15–27 mm), 232 females (17.5–44.5 mm), 272 ovig. females (19–26 mm), Sta. No. 202A. 153 males (18.5–32.5 mm), 46 females (16.5–46 mm), 72 ovig. females (21.5–34.5 mm), Sta. No. 202B. 16 males (18.5–40 mm), 11 females (18–23 mm), 7 ovig. females (21.5–34.5 mm), Sta. No. 202C. 2 males (16.5, 19 mm), 4 females (16–17 mm), 1 ovig. female (27 mm), Sta. No. 203A. 1 female (23 mm), Sta. No. 206A. 21 males (23.5–30 mm), 4 females (21.5–25 mm), 11 ovig. females (21–29 mm), Sta. No. 266A.

All trawled, depths from 22 to 196 m, bottoms (where noted) sand with mud, clay, or coral.

FIGURE 2.—First male pleopods: *a*, *Portunus argentatus* (205 mm, Sta. 202B), pleopod close to form b; *b*, *P. argentatus* (20 mm, Sta. 202B), relatively straight pleopod; *c*, *P. argentatus* (20.5 mm, Sta. 202A), pleopod approaching form a; *d*, *Thalamita gracilipes* (10.5 mm, Sta. B–16) whole pleopod. Tips of pleopods *a–d*, respectively: *e–h*. (Scales: *a–d*, 0.5 mm; *e–h*, 0.1 mm.)

REMARKS.—Because two forms of male pleopods have been described for this species (Stephenson and Rees, 1967, p. 16), pleopods of all the males in the present collection were examined. The number involved (almost 1500) no doubt greatly exceeds the numbers examined in any other species of portunid and possibly any other brachyuran.

All males were concluded to belong to form B, which typically possesses a pleopod with a right-angled bend. The range of the present material clearly links the shapes figured by Crosnier (1962, fig. 77) and by Stephenson and Rees (1967, fig. 2), with the bulk being intermediate.

A very small number of individuals (not more than five) possessed pleopods with considerable curvature near their right-angled bends (fig. 2*a*, this paper). A greater number (33) possessed relatively straight pleopods (fig. 2*b*). The latter were relatively small specimens (breadths 15–ca. 21.5 mm) although they overlapped considerably the sizes of those with normal pleopods (breadths 17.5–40 mm). It is assumed that the small specimens were immature males, which would have developed curved pleopods on later moults.

In addition to variations in curvature, there were variations in the form and spinulation of the tips of the pleopods (see figs. 2*e–g*). While none showed the bulbous shape of form A (Stephenson, 1961, figs 1F, 3D), one specimen showed slight swelling and reasonably dense spinulation (figs. 2*c*, *g*).

A single specimen from Station AB 21–63 was unsexable because of presumed parasitic castration caused by parasites in both branchial cavities. Three specimens with parasites in a single branchial cavity were noted (two with left cavities, one with right, all from Station AB 21–63). In none of these specimens was the sex indeterminable (two females, one male). Four *Sacculina*-infested specimens were noted. Two of these were clearly males, with normal pleopods, while two were most probably females. *Sacculina* infestation had less obvious effects upon secondary sexual characteristics than had the double branchial infestation.

DISTRIBUTION.—East coast of Africa to Japan, Australia, and Hawaii.

Portunus emarginatus Stephenson and Campbell

Portunus emarginatus Stephenson and Campbell, 1959, pp. 107–8, figs. 2H, 3H, pl. 2 (fig. 4), pls. 4H, 5H.—Crosnier, 1962, pp. 66–8, figs. 108, 112–4, 116, 120, 121.—Stephenson and Rees, 1967, p. 30.

?*Portunus longispinosus* Rathbun.—Stephenson and Campbell, 1959, pp. 104–6, figs. 2F, 3F, pl. 2 (fig. 2), pls. 4F, 5F.

MATERIAL EXAMINED.—1 male (10.5 mm), Sta. No. B9.
Dredged, 18–24 ft., fine white sand.

REMARKS.—See *Portunus* cf. *longispinosus*.

DISTRIBUTION.—Malgache [Madagascar], Australia, and Palau.

Portunus gladiator (Alcock)

Neptunus (*Amphitrite*) *gladiator* Alcock, 1899a, pp. 35–6.—Shen, 1937, pp. 101–3, figs. 2a–c.

Monomia gladiator (Fabricius).—Barnard, 1950, p. 156.

Portunus gladiator Fabricius.—Crosnier, 1962, pp. 51–4, figs. 72, 76, 78, 82, 83, pl. 3 (fig. 2).

?*Portunus gladiator*.—Fabricius, 1798, p. 368.

Not *Portunus gladiator* Fabricius.—Stephenson and Campbell, 1959, pp. 110–111, figs. 2J, 3J, pl. 3 (fig. 2), pls. 4I, 5J.

MATERIAL EXAMINED.—2 females (50.5, 51.5 mm), Sta. No. AB-20. 1 male (31.5 mm), Sta. No. 202 B.

Trawled, depths from 58 to 90 m.

REMARKS.—As indicated by Stephenson and Rees (1967, p. 24), further work is required to clarify the confused synonymy of the *Portunus gladiator* complex. The present specimens were compared with Crosnier's material.

DISTRIBUTION.—Eastern South Africa, Malgache [Madagascar], India, and Hong Kong, and now near Mergui.

Portunus hastatoides Fabricius

Portunus hastatoides Fabricius, 1798, p. 368.—Stephenson and Campbell, 1959, pp. 101–2, figs. 2D, 3D, pl. 1 (fig. 4), pls. 4D, 5D.—Crosnier, 1962, pp. 68–9, figs. 98, 109, 117, 122, 123.—Sakai, 1965, p. 119, pl. 58 (fig. 2).—Stephenson and Rees, 1967, p. 27.

Neptunus (*Hellenus*) *hastatoides* (Fabricius).—Alcock, 1899a, pp. 38–9.—Sakai, 1939, pp. 391–2, pl. 47 (fig. 1).

Hellenus hastatoides (Fabricius).—Barnard, 1950, pp. 158–9.

MATERIAL EXAMINED.—2 males (26.5, 33.5 mm), Sta. No. AB 42–63. 1 male (33 mm), Sta. No. 47B–63. 8 males (15–29.5 mm), 2 females (ca. 24.5, 27 mm), Sta. No. 48–63. 2 males (37, 40.5 mm), 2 females (40.5, 42 mm), 1 ovig. female (35 mm), Sta. No. 203C. 1 male (36.5 mm), Sta. No. 218A. 1 male (31.5 mm), Sta. No. 224A 1 male (ca. 27.5 mm), Sta. No. 228A. 4 males (30.5–39.5 mm), 4 females (27–34 mm), Sta. No. 9682.

Trawled (except Sta. No. 48–63 dredged), depths from 22 to 84 m, bottom (when noted) from silty sand through mud to clay.

DISTRIBUTION.—East Coast of Africa to Japan, Australia, and Philippines, but not from the Red Sea.

Portunus cf. *longispinosus* (Rathbun)

cf. *Portunus* (*Xiphonectes*) *longispinosus* (Dana).—Rathbun, 1906, p. 871, fig. 30, pl. 12 (fig. 6).

MATERIAL EXAMINED.—1 male (14 mm), Sta. No. B 16.

Dredged, 12-18 ft sand, shell, and coral rubble.

REMARKS.—As indicated by Stephenson and Rees (1967, p. 28), there is confusion over the different species in the *Portunus longispinosus* complex. The present specimen keys out in Stephenson and Rees as *P. longispinosus* Rathbun but differs from Rathbun's illustration (1906, pl. 12: fig. 6), in possessing a less strongly embossed carapace.

A brief examination (at the Smithsonian Institution by the senior author) of the material identified by Rathbun as *P. longispinosus* showed that there is variation in a number of features; it is hoped that this and other material in the complex can be dealt with in a later publication.

Portunus minutus (Shen)

Neptunus (*Lupocycloporus*) *minutus* Shen, 1937, p. 115, fig. 9a–c.
Portunus minutus (Shen).—Stephenson and Campbell, 1959, p. 89 (in key).

MATERIAL EXAMINED.—1 female (19 mm), Sta. No. AB 41A.

Trawled, 29–33 m.

REMARKS.—This specimen has fine spines on the anterior border of the arm of the cheliped. Stephenson, in a later publication, will deal with a new species very close to *P. minutus*.

DISTRIBUTION.—Previously from Hong Kong and Gulf of Siam. Now off the Gulf of Martaban.

Portunus orbicularis (Richters)

Achelous orbicularis Richters, 1880, p. 153, pl. 16 (figs. 14, 15).—Henderson, 1893, p. 371.—Stebbing, 1920, p. 236.—Barnard, 1950, pp. 159–60, fig. 31a
Neptunus (*Achelous*) *orbicularis* (Richters).—Alcock, 1899a, p. 47.
Portunus (*Achelous*) *orbicularis* (Richters).—Rathbun, 1906, p. 871, pl. 12 (fig. 4).—Edmondson, 1946, p. 280; 1954, pp. 239–41, figs. 16c–e, 17b.
Cycloachelous orbicularis (Richters).—Ward, 1942, p. 51.
Portunus orbicularis (Richters).—Crosnier, 1962, pp. 58–61, figs. 95, 99–102.

MATERIAL EXAMINED.—3 females (12–16 mm), Sta. No. B 16.

Dredged, 12–18 ft, sand, shell, and coral rubble.

REMARKS.—The descriptions by Richters, Alcock, and Crosnier mention a carapace that is almost smooth. Crosnier (1962, p. 60), who gives the most recent detailed description, states: "*Carapace* glabre, subcirculaire, avec des granules surtout à la périphérie et sur les régions cardiaque et intestinale." His figure 99 shows this granulation and indicates that it is very fine. Meanwhile Barnard (1950, p. 159) had stated: "Carapace . . . feebly granulate in places, with patches of distinct granules mostly near the periphery and on the gastric and cardiac regions." His figure 31a shows a much more distinct and coarsely granular form than Crosnier's. The present

specimens have distinctly granular carapaces, with fine granules near the periphery, with diffuse patches of moderate-sized granules in the protogastric region, with even larger granules in the mesogastric region, and with moderate-sized granules again in the cardiac region. In these respects, they resemble Barnard's material.

Barnard also shows a single elevation in the cardiac region tapering away posteriorly, which is visible on the present specimens but not on Crosnier's figure. Edmonson (1954, fig. 17b) shows a similar embossing of the carapace on a Hawaiian specimen, but in Rathbun's plate (1906, pl. 12: fig. 4) a different shape of the cardiac region is shown and also conspicuous metagastric ridges. Thus, merely on the basis of carapace ornamentation, three forms could all have been called *P. orbicularis:* (1) Richters' and Crosnier's, and presumably Alcock's (2) Barnard's, Edmondson's, and the present specimens, and (3) Rathbun's.

The male pleopod figured by Crosnier (fig. 101) also differs from that of Edmondson (1954, fig. 16d), but the extent to which this is due to Edmondson's draftsmanship is unknown.

It is evident that a careful re-examination of all available material of the present "species" should be made. The authors are reluctant to erect a new species without a male specimen being available.

Portunus pelagicus (Linnaeus)

Cancer pelagicus Linnaeus, 1766, p. 1042.
Neptunus pelagicus (L.).—Sakai, 1939, pp. 387–8, pl. 49.
Portunus pelagicus (L.).—Stephenson and Campbell, 1959, pp. 96–8, figs. 2A, 3A, pl. 1 (fig. 1), pls. 4A, 5A.—Crosnier, 1962, pp. 43–5, figs. 58, 61, 67.—Sakai, 1965, p. 117, pls. 55, 56.—Stephenson and Rees, 1967, p. 34.

Material examined.—2 females (33.5, ca. 40 mm) (cephalothorax only, specimens soft), *Anton Bruun* Cr. 1, Thailand, Patong Phuket; Mar. 22, 1963; coll. Taylor, Tyler, Sterling, and Rogers.

Either shore or dipnet collection.

Distribution.—East Africa to Tahiti, also Mediterranean.

Portunus pulchricristatus (Gordon)

Neptunus (*Hellenus*) *spinipes* Alcock, 1899a, pp. 31–2, 39–40.
Neptunus (*Hellenus*) *pulchricristatus* Gordon, 1931, p. 534, figs. 8, 10A.
Portunus pulchricristatus (Gordon).—Stephenson and Rees, 1967, p. 35.
Not *Neptunus* (*Amphitrite*) *spinipes* Miers, 1886, p. 178, pl. 25 (fig. 1).

Material examined.—6 males (18.5–23.5 mm), 1 female (20 mm), 5 ovig. females (19.5–ca. 23 mm), Sta. No. AB 41–63. 4 males (24–26 mm), 1 female (23.5 mm), 1 ovig. female (20.5 mm),

Sta. No. 41A. 3 males (ca. 21–22.5 mm), Sta. No. AB 48–63. 95 males (21–28.5 mm), 2 females (20, 26 mm), 13 ovig. females (20.5–25 mm), Sta. No. 201A. 1 male (19.5 mm), 1 female (ca. 19 mm), Sta. No. 213A. 8 males (21.5–29 mm), 2 females (21.5, 25 mm), 2 ovig. females (20, 24.5 mm), Sta. No. 221A. 1 male (22.5 mm), Sta. No. 255A. 1 male (19 mm), Sta. No. 262A. 1 male (27.5 mm), Sta. No. 264A.

Trawled (except Sta. No. AB 48–63 dredged), depths from 29 to 291 m, muddy bottoms.

REMARKS.—A single male (25.5 mm, Sta. No. 201A) has one parasitized branchial cavity.

DISTRIBUTION.—Oman to Philippines, but not Australia.

Portunus sanguinolentus (Herbst)

Cancer sanguinolentus Herbst, 1796, p. 161, pl. 8 (figs. 56, 57).

Portunus sanguinolentus (Herbst).—Fabricius, 1798, p. 367.—Stephenson and Campbell, 1959, pp. 98–9, figs. 2B, 3B, pl. 1 (fig. 2), pls. 4B, 5B.—Crosnier, 1962, pp. 45–7, figs. 59, 62, 63, 68.—Sakai, 1965, p. 116, pl. 53.—Stephenson and Rees, 1967, p. 45.

Neptunus sanguinolentus (Herbst).—Sakai, 1939, p. 387, pl. 47 (fig. 1).

MATERIAL EXAMINED.—1 male (42 mm), Can 26. 1 male (42 mm), Sta. No. AB 28d–63. 1 male (40 mm), Sta. No. 32.

Dipnet.

DISTRIBUTION.—East Africa to Australia. Current work shows that Hawaiian specimens are pigmented differently from Japanese and Australian material, but the precise status of the Hawaiian form has not yet been determined.

Portunus trituberculatus (Miers)

Portunus pelagicus De Haan 1835, p. 37, pls. 9, 10.

Neptunus trituberculatus Miers, 1876, p. 222; 1886, p. 172.—Sakai, 1934, p. 303; 1936, p. 129, pl. 37.

Portunus trituberculatus (Miers).—Rathbun, 1902, p. 26.—Stephenson and Campbell, 1959, p. 90 [in key].—Sakai, 1965, pp. 116–7, pl. 54.—Stephenson and Rees, 1967, p. 50.

Neptunus (*Neptunus*) *trituberculatus* (Miers).—Sakai, 1939, p. 388, pl. 50.

MATERIAL EXAMINED.—1 female (ca. 97 mm), *Anton Bruun* Cr. 1, India, north side Okah Point, Port Okah; Mar. 9, 1963. 2 males (ca. 160, 170 mm), Sta. No. 46–63.

Sta. No. 46–63 probably trawled, depth 23–25 m.

DISTRIBUTION.—Red Sea, China, and Japan, and now India and Bay of Bengal.

Genus *Scylla* de Haan, 1833

Scylla serrata (Forskål)

Cancer serratts Forskål, 1775, p. 90.
Scylla serrata (Forskål).—Stephenson and Campbell, 1960, pp. 111–5, fig. 2N, pl. 4 (fig. 4), pls. 5N, 6C.—Crosnier, 1962, pp. 72–3, figs. 128, 129.—Stephenson and Rees, 1967, p. 55.

MATERIAL EXAMINED.—1 ovig. female (ca. 86 mm), *Anton Bruun* Cr. 1, India, Visakhapatanan Port, July 31, 1963.

Habitat uncertain.

DISTRIBUTION.—East Africa to Tahiti including Japan, Australia, and New Zealand.

Genus *Thalamita* Latreille, 1829

Thalamita admete (Herbst)

Cancer admete Herbst, 1803, pp. 40–1, pl. 57 (fig. 1).
Thalamita admete (Herbst).—Sakai, 1939, pp. 414, 421–2, pl. 85 (fig. 1).—Stephenson and Hudson, 1957, pp. 320, 324–6, figs. 2I, 3I, pl. 1 (fig. 1), pls. 7A, 10A.—Crosnier, 1962, pp. 96–7, figs. 154, 157, 162–4, 168.—Stephenson and Rees, 1967, p. 56.
Thalamita edwardsi Borradaile.—Crosnier, 1962, p. 98, fig. 158.
Thalamita dispar Rathbun, 1914, p. 657, pl. 1 (fig. 4).

MATERIAL EXAMINED.—3 males (ca. 5–26 mm), Sta. No. B9. 2 males (9, 13 mm), 1 ovig. female (10 mm), Sta. No. B16.

Dredged, 12–24 ft, sandy bottoms, lagoons at Cocos Keeling I.

REMARKS.—Stephenson and Rees (1967, pp. 56–57) have detailed the synonymy of this species. Examination of Rathbun's (1914) type of *T. dispar* by the senior author confirms that it belongs to *T. admete*. Stephenson made the following notes:

Resembles *T. edwardsi* in (1) cardiac ridges of carapace just recognisable, (2) posterior mesobranchial ridges represented by a small pimple, (3) hands of chelipeds smooth, no granules on outer surface. Uppermost carina of outer surface coarsely beaded, middle and lowermost smooth, (4) no trace of fourth anterolateral tooth on right, at most a rudiment on left. Male pleopods—resembling Fig. 20d in Stephenson and Rees MS.

DISTRIBUTION.—Red Sea and East Africa to Tahiti.

Thalamita chaptalii (Audouin)

Portunus chaptalii Audouin, 1826, p. 83 [figs. *in* Savigny, 1809, pl. 4 (fig. 1)].
Thalamita chaptali (Audouin).—Stephenson and Hudson, 1957, pp. 327–8. figs. 2F, 3F, pl. 1 (fig. 3), pls. 7C, 10B.—Forest and Guinot, 1961, p. 34, figs. 21A, B.—Sankarankutty, 1961a, p. 106.—Crosnier, 1962, pp. 111, 113, figs. 184, 189, 191.—Stephenson and Rees, 1967, p. 64.

MATERIAL EXAMINED.—1 ovig. female (8 mm), *Anton Bruun* Cr. 1, Thailand, Patong Phuket; Feb. 22, 1963; coll. Taylor, Tyler, Sterling, and Rogers.

Probably shore collection.

REMARKS.—Without accompanying males, there is some uncertainty in the above identification.

DISTRIBUTION.—Malgache [Madagascar] and the Red Sea to Australia and Tahiti.

Thalamita crenata (Latreille)

Portunus crenatus Latreille, 1829 [fide Milne Edwards, H., 1834, p. 461].
Thalamita crenata (Latreille).—Alcock, 1899a, pp. 76–7.—Sakai, 1939, pp. 413–15, pl. 84 (fig. 3).—Edmondson, 1954, pp. 267–9, figs. 39b, 40a–f.—Stephenson and Hudson, 1957, pp. 332–4, figs. 2Q, 3Q, pl. 2 (fig. 3), pls. 7F, 9C.—Sankarankutty, 1961a, pp. 106–7.—Crosnier, 1962, pp. 130–2, figs. 220, 226, 227, 232, 233.—Stephenson and Rees, 1967, p. 66.

MATERIAL EXAMINED.—1 male (14.5 mm), 1 female (53.5 mm), *Anton Bruun* Cr. 1, Thailand, Patong Phuket; Feb. 22, 1963; coll. Taylor, Tyler, Sterling, and Rogers.

Probably shore collection.

REMARKS.—Both specimens are without their chelipeds, which are of diagnostic importance.

DISTRIBUTION.—East Africa and Red Sea to Japan, Australia, Hawaii, Society Is., and Tuamotus.

Thalamita demani Nobili

Thalamita demani Nobili, 1905, p. 402; 1906, pp. 209–10.—Crosnier, 1962, pp. 124–5, figs. 200, 208–9.—Stephenson and Rees, 1967, p. 74.
Thalamita invicta de Man, 1895, p. 565, pl. 13 (figs. 11, 11a).
Thalamita cooperi Stephenson and Hudson, 1957, pp. 331–2 [in part].
Thalamita trilineata Stephenson and Hudson, 1957, pp. 359–60, figs. 2E, 3E, pl. 6 (fig. 4), pls. 8S, 10L.—Stephenson, 1961, p. 124, pl. 4 (fig. 2I).
?*Thalamita invicta*.—Thallwitz, 1891, pp. 46–7, fig. 11.
Not *Thalamita cooperi* Borradaile, 1902, pp. 206–7, fig. 37.—Sankarankutty, 1961b, p. 122, fig. 113.

MATERIAL EXAMINED.—1 female (12.5mm), Sta. No. B 17.

Dredged, 6 ft., in weed, lagoon at Cocos Keeling I.

REMARKS.—If the small fourth anterolateral teeth are overlooked, females of this species are confused easily with *T. cooperi* Borradaile.

DISTRIBUTION.—Red Sea and Malgache [Madagascar] to Australia and Philippines.

Thalamita prymna (Herbst)

Cancer prymna Herbst, 1803, pp. 41–2, pl. 57 (fig. 2).
Thalamita prymna (Herbst).—Alcock, 1899a, pp. 78–9.—Sakai, 1939, pp. 413, 416, pl. 51 (fig. 1); 1965, p. 125, pl. 64 (fig. 2).—Stephenson and Hudson, 1957, pp. 346–9, figs. 2R, 3R, pl. 4 (fig. 3), pls. 8L, 9E.—Crosnier, 1962, pp. 136–8, figs. 234–6.—Stephenson and Rees, 1967, p. 89.

Material examined.—4 males (38.5–63.5 mm), 2 females (40.5–62 mm), *Anton Bruun* Cr. 1, India, north side Okah Point, Port Okah; Mar. 9, 1963. 2 males (32.5- ca. 48.5 mm) (both without chelae), *Anton Bruun* Cr. 1, Thailand, Patong Phuket; Mar. 22, 1963; coll. Taylor, Tyler, Sterling, and Rogers.

Both probably shore collections.

Remarks.—In the larger specimens the spines on the ridge of the basal antennal joint are largely worn away, with resultant problems in identification (see Stephenson and Rees, 1967, p. 90).

Distribution.—East Africa and Red Sea to Marshalls and Samoa, including Australia and Japan.

Thalamita gracilipes (A. Milne Edwards)

Figures 2*d*, *h*

Thalamonyx gracilipes A. Milne Edwards, 1873, pp. 169–71, pl. 4 (figs. 3, 3a–d).—Alcock, 1899a, pp. 71–2.—Rathbun, 1906, p. 873.—Edmondson, 1954, pp. 251–2, figs. 26a, b.—Crosnier, 1962, pp. 91–3, fig. 153 bis a–d.
Thalamonyx danae var. *gracilipes* A. Milne Edwards.—Miers, 1886, pp. 192–3.
Thalamita gracilipes (A. Milne Edwards).—Stephenson and Hudson, 1957, pp. 318, 361.
? *Goniosoma* (*Thalamonyx*) *danae* A. Milne Edwards.—Ortmann, 1894, p. 83.

Material examined.—Male (10.5mm), Sta. No. B–16. Male (6 mm), ovig. female (11.5 mm), Sta. No. B–34.

Dredged, 12–24 ft, sandy bottom, lagoons at Cocos Keeling I.

Remarks.—A. Milne Edwards in 1873 listed the diagnostic differences between this species and *Goniosoma danae* A. Milne Edwards (1869, pp. 153–5, pl. 7: figs. 6, 7): *T. gracilipes* has an almost entire front, a narrower carapace, and longer legs. None of these differences do appear to have diagnostic value and the entirety of the front and carapace breadth appear to depend on the size of the specimen—compare Crosnier (1962, fig. 153 bis a) with A. Milne Edwards (1873, pl. 4: fig. 3). Milne Edwards' descriptions and figures indicate that there is an apparently important difference in the ornamentation of the posterior part of the carapace. In *G. danae* there are ovoid elevations in the mesobranchial area but apparently none in the cardiac region. In *T. gracilipes* there are four ridges forming an arc, one in each mesobranchial and one in each cardiac region.

Miers' specimens appear identical to the largest of the present specimens, being pubescent to the point of hirsuteness. Ortmann (1894) considered that *G. danae* and *T. gracilipes* were synonymous, presumably working from Milne Edwards' (1873) diagnostic features.

Forest (*in* Crosnier, 1962, p. 93) wondered whether *T. gracilipes* of Edmondson (1954) was a different species because of its less prominent front and because it had a different male abdomen. The form of the abdomen of the larger male in the present collections greatly resembles that figured by Edmondson (1954, fig. 26b). Edmondson, however, shows a continuous ridge in the posterior part of the carapace; possibly this is due to inaccurate draftsmanship.

Crosnier's figure of a male pleopod (1962, fig. 153 bis d) is obviously from an immature specimen. That of the larger male in the present collection is short, curved, with a slightly swollen tip ending obliquely. Subterminally on the outer side, there are stout bristles, mostly in pairs, with nine visible in profile view followed by thinner bristles; a sparse row of spinules is also present. On the inner side, in profile view, there are five elongate hook-shaped bristles followed by four almost straight bristles.

Edmondson has noted that *Thalamonyx* has been regarded variously as a subgenus of *Charybdis*, a separate genus, or as part of the genus *Thalamita*. Because of the increasing indefiniteness of the boundaries of the genus *Thalamita* (see Stephenson and Rees, 1967a, pp. 59–61), the present authors follow Stephenson and Hudson (1957) and regard the present species as belonging to *Thalamita*.

DISTRIBUTION.—Madagascar, Andaman Is., New Caledonia, Tongo Is., Hawaii.

Thalamita spinifera Borradaile

Thalamita exetastica var. B. *spinifera* Borradaile, 1902, p. 203.
Thalamita spinifera Borradaile.—Rathbun, 1906, pp. 874–5.—Edmondson, 1951, p. 221; 1954, pp. 269–70, figs. 41a–d, 42a.—Crosnier, 1962, pp. 125–7, figs. 210, 211, 214, 215, pl. 11 (fig. 1).—Stephenson and Rees, 1967, p. 93.

MATERIAL EXAMINED.—1 male (18.5 mm), Sta. No. 262A.
Trawled, 79 m, sandy bottom.

DISTRIBUTION.—Malgache [Madagascar], Maldives, Philippines, and Hawaii.

Thalamita species

This specimen could not be identified beyond the genus.

MATERIAL EXAMINED.—1 yg. male (6 mm), Sta. No. 28A.
Trawled, 66 m.

TABLE 1.—*Data on International Indian Ocean Expedition Stations* (GMT = Gulf of Mexico Shrimp Trawl; depth = meters unless otherwise stated; generic abbreviations: *C.* = *Charybdis*, *L.* = *Lupocyclus*, *P.* = *Portunus*, *S.* = *Scylla*, *T.* = *Thalamita*)

Sta. No.	Anton Bruun Cruise No.	Position	Gear	Depth	Bottom, other notes	Date	Portunid species
AB3–63							*C. smithii* (3)
Can 26	A	31°58′ N, 49°17′ E	dipnet	surface		31/i/1963	*P. sanguinolentus* (1)
AB–20	1	09°13′ N, 95°51′ E	GMT	60–58		23/iii/1963	*C. hongkongensis* (12)
							C. miles (2)
							P. gladiator (2)
AB21–63	1	09°54′ N, 97°42′ E	GMT	70		24/iii/1963	*C. miles* (1)
							L. philippinensis (3)
							P. argentatus (132)
22	1	10°37′ N, 97°34′ E	?	?		24/iii/1963	*P. argentatus* (3)
AB–22A	1	10°39′ N, 97°06′ E	GMT	290		24/iii/1963	*P. argentatus* (20)
AB28a–63	1	11°52′ N, 92°49′ E	GMT	66		27/iii/1963	*P. argentatus* (2)
							Thalamita sp.
AB28d–63	1	11°37′ N, 92°56′ E	dipnet?	surface?		27/iii/1963	*P. sanguinolentus* (1)
AB32	1	12°52′ N, 94°13′ E	dipnet	surface		28/iii/1963	*P. sanguinolentus* (1)
AB–37	1	13°28′ N, 97°19′ E	GMT	73–81		30/iii/1963	*C. rostrata* (1)
AB–40–63	1	15°21′ N, 96°24′ E	GMT	26–27		31/iii/1963	*C. callianassa* (1)
							C. rostrata (63)
AB–41	1	15°04′ N, 95°51′ E	GMT	44–46		31/iii/1963	*C. vadorum* (2)
							P. pulchriocristatus (12)
AB–41A	1	15°04′ N, 95°51′ E	GMT	29–33		31/iii/1963	*C. hongkongensis* (4)
							C. vadorum (6)
							P. minutus (1)
							P. pulchricristatus (6)

AB–42	1	15°08′N, 94°54′E	GMT	35		1/iv/1963	*C. hongkongensis* (1)
							C. vadorum (4)
							P. hastatoides (2)
AB–44	1	21°52′N, 91°36′E	GMT	15		4/iv/1963	*C. rostrata* (31)
AB–44a	1	21°43′N, 91°33′E	GMT	15		4/iv/1963	*C. rostrata* (7)
AB–45	1	21°32′N, 91°29′E	GMT	17		4/iv/1963	*C. rostrata* (2)
AB46–63	1	21°00′N, 91°59′E	GMT?	23–25?		5/iv/1963	*C. natator* (1)
							C. variegata (1)
							P. trituberculatus (2)
AB–47B–63	1	19°50′N, 92°55′E	GMT	30–22		5/iv/1963	*C. feriatus* (1)
							P. argentatus (1)
							P. hastatoides (1)
AB48–63	1	19°41′N, 93°08′E	dredge	37		5/iv/1963	*P. hastatoides* (10)
							P. pulchricristatus (3)
AB49–63	1	19°32′N, 92°52′E	GMT	53		6/iv/1963	*P. argentatus* (1)
–	1	17°42′N, 83°17′E (Visakhapatnam)				12–14/iv/1963	*S. serrata* (1)
201A	4B	17°54′N, 72°27′E–17°57′N, 72°23′E	GMT	46–55	Green mud and shells	13/xi/1963	*C. feriatus* (1)
							C. hoplites (321)
							C. natator (2)
							P. pulchricristatus (110)
202A	4B	17°25′N, 71°39′E–17°21′N, 71°41′E	GMT	96–106	Greenish sand and mud	13/xi/1963	*C. hoplites* (9)
							C. riversandersoni (1)
							C. smithii (1)
							L. philippinensis (7)
							P. argentatus (1742)
202B	4B	17°41′N, 71°33′E–17°45′N, 71°32′E	GMT	90		14/xi/1963	*C. hoplites* (17)
							P. argentatus (271)
							P. gladiator (1)
202C	4B	18°27′N, 71°13′E–18°28′N, 71°09′E	GMT	84–97	Coral, sand	14/xi/1963	*P. argentatus* (34)

TABLE 1.—*Data on International Indian Ocean Expedition Stations*—Continued

Sta. No.	Anton Bruun Cruise No.	Position	Gear	Depth	Bottom, other notes	Date	Portunid species
203A	4B	19°07′N, 71°41′E–19°08′N, 71°42′E	GMT	69–68	Sand, green mud, shells	14/xi/1963	*P. argentatus* (7)
203B	4B	19°47′N, 72°04′E–19°50′N, 72°05′E	GMT	27–29	Soft green clay, mud	14/xi/1963	*C. callianassa* (4)
203C	4B	20°22′ N, 71°47′ E–20°22′ N, 71°44′ E	GMT	26	Brown mud	15/xi/1963	*C. callianassa* (144) *P. hastatoides* (3)
204A	4B	20°30′ N, 70°54′ E–20°30′N, 70°50′E	GMT	33	Brown, sticky mud	15/xi/1963	*C. callianassa* (2)
206A	4B	20°23′ N, 70°00′ E–20°20′ N, 69°55′ E	GMT	71–79	Green clay, shells, sand	15/xi/1963	*P. argentatus* (1)
207A	4B	19°56′ N, 69°24′ E–19°51′ N, 69°24′ E	GMT	280	Light organic chunks, green clay	16/xi/1963	*C. smithii* (1)
212A	4B	21°29′ N, 69°27′ E–21°27′ N, 69°25′ E	GMT	35–36	Soft green clay, mud	16/xi/1963	*C. hoplites* (35)
213A	4B	21°11′ N, 69°16′ E–21°08′ N, 69°13′ E	GMT	70–72	Green mud, sand, shell	17/xi/1963	*C. hoplites* (2) *P. pulchricristatus* (2)
218A	4B	22°03′ N, 68°19′ E–22°02′ N, 68°17′ E	GMT	79–84	Greenish silty sand	18/xi/1963	*C. hoplites* (3) *P. hastatoides* (1)
221A	4B	22°32′ N, 68°07′ E–22°31′ N, 68°05′ E	GMT	57	Sandy green clay (mud)	18/xi/1963	*C. hoplites* (2) *P. pulchricristatus* (12)
222A	4B	22°45′ N, 68°24′ E–22°43′ N, 68°22′ E	GMT	26–27	Soft, sticky, green clay, mud	18/xi/1963	*C. callianassa* (1) *C. hoplites* (1)

223A	4B	22°54′ N, 68°36′ E–22°52′ N, 68°34′ E	GMT	15	Soft mud	19/xi/1963	*C. callianassa* (26)
224A	4B	23°00′ N, 68°10′ E–23°01′ N, 68°08′ E	GMT	24	Soft mud	19/xi/1963	*C. callianassa* (6) *P. hastatoides* (1)
228A	4B	23°45′ N, 67°26′ E–23°43′ N, 67°23′ E	GMT	23–24	Greenish brown clay	20/xi/1963	*P. hastatoides* (1)
231A	4B	23°13′ N, 66°40′ E–23°18′ N, 66°39′ E	GMT	183–155	Sands, shells, mud	20/xi/1963	*C. smithii* (2)
237A	4B	25°04′ N, 65°26′ E–25°04′ N, 65°24′ E	GMT	26	Hard packed mud	22/xi/1963	*C. hoplites* (1)
241A	4B	24°54′ N, 63°52′ E–24°56′ N, 63°53′ E	GMT	101–90	Mud, shell fragments	22/xi/1963	*C. hoplites* (45)
RF–2	4B?	25°06′35″N, 63°48′65″E [sic]	Hand collecting	Shore	Rocks and sand	27/xi/1963	*C. orientalis* (6)
LW–1	4B?	25°06′35″N, 63°48′65″E [sic]	Rotenone and dip net	0–8 ft	Rocks, sand, and scanty scattered coral	27/xi/1963	*C. orientalis* (14)
248A	4B	25°10′N, 60°27′E–25°08′N, 60°23′E	GMT	65–82	Clay, mud, shell	29/xi/1963	*C. hoplites* (2)
249A	4B	25°16′N, 59°40′E–25°16′N, 59°35′E	GMT	115–94	Sticky clay, shell	20/xi/1963	*C. hoplites* (5) *C. smithii* (15)
251B	4B	25′17′N, 59°05′E	dredge	35	Green-brown mud, clay, broken shell	29/xi/1963	*Charybdis* sp. (1 yg.)
252A	4B	25°20′N, 58°27′E–25°20′N, 58°30′E	GMT	101	Green mud, sand	29/xi/1963	*C. hoplites* (1) *C. smithii* (61)
253A	4B	25°25′N, 58°20′E–25°23′N, 58°24′E	GMT	82–90	Green mud, clay	29/xi/1963	*C. hoplites* (1) *C. smithii* (3)

TABLE 1.—*Data on International Indian Ocean Expedition Stations*—Continued

Sta. No.	Anton Bruun Cruise No.	Position	Gear	Depth	Bottom, other notes	Date	Portunid species
255A	4B	25°50′N, 57°07′E–25°45′N, 57°07′E	GMT	92–95	Clay, mud, sand, minute gastropod shells	30/xi/1963	*C. hoplites* (1) *C. miles* (2) *P. pulchricristatus* (1)
256A	4B	26°10′N, 57°02′E–26°13′N, 57°02′E	GMT	64–55	Green mud	30/xi/1963	*C. miles* (5)
258A	4B	26°58′N, 56°43′E–26°56′N, 56°42′E	GMT	33–35	Soft clay, mud, shell fragments	1/xii/1963	*C. longicollis* (1)
261A	4B	25°52′N, 56°53′E–25°53′N, 56°53′E	GMT	99	Green mud, few small shells	1/xii/1963	*C. miles* (1)
262A	4B	25°37′N, 56°34′E–25°39′N, 56°34′E	GMT	79	Green muddy sand	1/xii/1963	*C. miles* (2) *P. pulchricristatus* (1) *T. spinifera* (1)
263A	4B	25°12′N, 56°47′E–25°12′N, 56°51′E	GMT	206	Grey soft mud	2/xii/1963	*C. hoplites* (20) *C. riversandersoni* (2) *C. smithii* (4)
264A	4B	25°02′N, 56°52′E–25°08′N, 56°52′E	GMT	291–272	Sticky grey clay, and mud	2/xii/1963	*C. hoplites* (7) *C. riversandersoni* (4) *C. smithii* (4) *P. pulchricristatus* (1)
265A	4B	24°32′N, 56°53′E–24°34′N, 56°52′E	GMT	84–90	Black mud	2/xii/1963	*C. hoplites* (5)

266A	4B	24°27′ N, 56°50′ E–24°30′ N, 56°47′ E	GMT	47–49	Dark green sandy mud	2/xii/1963	*C. longicollis* (1) *P. argentatus* (36)
268A	4B	24°12′ N, 57°27′ E–24°13′ N, 57°22′ E	GMT	364–368	Grey clay, mud, shell fragments	2/xii/1963	*C. hoplites* (1) *C. longicollis* (1) *C. smithii* (18) *Charybdis* sp. (fragmented)
270A	4B	22°05′ N, 59°47′ E–22°08′ N, 59°48′ E	GMT	55	Sand, some clay	4/xii/1963	*C. hoplites* (1)
172	4A	14°44′ N, 51°02′ E	Dipnet	surface		15/x/1963	*C. smithii* (1)
B9		Cocos-Keeling, lagoon ½ mile SW of Wharf, Central Direction I	dredge	18–24 ft	Fine white sand; coll. Virginia Orr	18/i/1963	*P. emarginatus* (1) *T. admete* (3)
B16		Cocos-Keeling lagoon 1½ miles S by E of Possession Pt, Horsburgh I	dredge	12–18 ft	Sand, shell and coral rubble; coll. Virginia Orr.	21/i/1963	*P.* cf *longispinosus* (1) *P.* cf. *orbicularis* (3) *T. admete* (3) *T. gracilipes* (1)
B17		Cocos-Keeling lagoon 300 yds off West I, just N of North Lagoon	dredge	6 ft	Heavy sea-weed, (mostly *Thalassia*); coll. Virginia Orr	21/i/1963	*T. demani* (1)
B34		Cocos-Keeling lagoon, 2 miles E of northern end of West I	dredge	24 ft	Hard fine sand and weed; coll. Virginia Orr	11/ii/1963	*T. gracilipes* (2)

TABLE 1.—*Data on International Indian Ocean Expedition Stations*—Continued

Sta. No.	Anton Bruun Cruise No.	Position	Gear	Depth	Bottom, other notes	Date	Portunid species
–	1	Thailand, Patong Phuket	dipnet?	shore?	Coll. Taylor, Tyler Sterling and Rogers	22/ii/1963	*P. pelagicus* (2) *T. chaptali* (1) *T. crenata* (2) *T. prymna* (2)
–	1	India, north side Okah Point, Port Okah				9/iii/1963	*P. trituberculatus* (1) *T. prymna* (6)
9682	?	18°48′ N, 72°37′ E	M.U.F. Janjira Bottom Trawl	12.5–14 fm		12/v/1964	*C. callianassa* (1) *C. feriatus* (1) *P. hastatoides* (8)

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